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Lung Cancer in Non-Smokers in Hong Kong

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Introduction

Bronchial cancer is an important health problem in Hong Kong causing an increasing number of deaths annually. The increase is particularly rapid among men. The death toll increased 50% (802–1217) between 1976–1980. The increase among women was slight (532–581) (Hong Kong, 1980).

Material and Method

In a recent survey of bronchial cancer (CHAN et al., 1979), among 208 male patients only 2 were non-smokers and among 189 female patients 84 were non-smokers. These form the subjects of this investigation. Matched controls were selected from orthopaedic patients.

All patients and controls were interviewed and questions asked about smoking habit of their spouses and their cooking habits, including the types of fuel used. Histological diagnoses of the tumours were obtained.

Results

The age distributions of the non-smoker patients and of the matched controls are shown in *Table 1*. The highest incidence is in the group above 70.

The histological types of the non-smoker's cancers are shown in *Table 2*. It can be seen that adenocarcinoma is the prevalent type. The two male cases are too few to be significant. In a previous study (CHAN and MACLENNAN, 1977) this histological type was also high among males although not as high as among females where it was 54.3% among 277 cases.

In *Table 3*, it is seen that there are less passive smokers among patients than the controls; and more non-smoking patients have non-smoking spouses. This finding is at variance with that of Dr. HIRAYAMA's (1981). He found that mortality from lung cancer of non-smoking women exposed to cigarette smoke of their husbands was increased two folds. The histological types of their cancers were not given. The present group is of course very small in comparison to Dr. HIRAYAMA's material.

The cooking habits of non-smoking women are shown in *Table 4*.

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Table 1: Age Distribution of *Non-smokers* in a Lung Cancer Case Control Study.

Age Group	Male		Female	
	Case	Control	Case	Control
39		6	6	7
40–49		6	13	21
50–59	1	3	19	42
60–69	1	7	19	30
70 –		8	27	39
	2	30	84	139

Table 2: Cell Types of Non-smokers' Lung Cancer Cases.

Cell type	Male	Female
Squamous or epidermoid	1	15
Small cell anaplastic	1	4
Adenocarcinoma		38
Large cell		2
Others and unspecified		10
No histological verification		15
	2	84

Table 3: Number of Passive Smokers among Non-smoking Female Lung Cancer Patients.

	Case	Control
Passive smoker	34 (40.5%)	66 (47.5%)
Non-passive smoker	50 (59.5%)	73 (52.5%)
	84	139

Table 4: Female Non-smokers' Cooking Habits.

	Total	Never cook	Never cook with Kerosene	Never cook with Kerosene or gas
		No.	No.	No.
Case	84	15 (22.4%)	23 (27.4%)	18 (21.4%)
Control	139	29 (20%)	56 (40.3%)	43 (30.0%)

22.4% claimed they never cooked, 27.4% never cooked with kerosene, and 21.4% never cooked with kerosene or gas. There appears to be less people who never cook with kerosene comparing to the control. The difference is found to be insignificant when non-smoking controls were considered. ($\chi^2 = 1.92$; $0.1 < P < 0.2$).

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Discussion

The interests of this study are:

1. The high incidence rate of female cancer among Southern Chinese (mainly Cantonese women). *Table 5* shows the high proportion of Cantonese. This feature has been reported from Singapore, San Francisco and Hawaii.
2. The high proportion of non-smoker cancer among women.
3. The high proportion of adenocarcinoma in this region and particularly in non-smoker cancer of females.

Table 5: Ethnic Groups of *Non-smoking Female Lung Cancer Patients*, Controls an Hong Kong General Female Population.

	Case	Control	Hong Kong General Population
Cantonese	68 (81%)	97 (70%)	75.7%
Chiu Chau	5 (6%)	14 (10%)	9.3%
Elsewhere in Kwangtung Province	6 (7%)	7 (5%)	6%
Elsewhere in China and others	5 (6%)	21 (15%)	9%
	84	139	100%

The aetiology of the adenocarcinoma among non-smokers has been the subject of speculation. In the present survey no conclusion can be made on the part played by the cooking habit. The association of carcinoma with tuberculosis was postulated by STEINITZ (1972). MOK et al. (1978) recently studied the association of active tuberculosis and lung cancer. They concluded that there was no causal relationship as both were quite common diseases and chance association was quite probable.

The high incidence of female cancer, particularly adenocarcinoma, among Southern Chinese awaits further elucidation.

There may be a common factor in this region for the high incidence of adenocarcinoma both in men and women. As it is not connected with cooking and smoking, the dietary habit has to be further studied. In an experimental study, FONG and CHAN (1977) produced adenocarcinoma of lung in the rats by feeding them nitrite and aminopyrine, two precursors of dimethyl-nitrosamine. It is possible that precursors may occur in the Cantonese diet which lead to in vivo nitrosamine formation. In the Cantonese diet, large amounts of grren vegetables may be present. The possibility of a high nitrite/nitrate content may account for the high incidence of lung cancer independent of cigarette smoking and air pollution. The two latter factors are supposed to lead to squamous carcinoma and small cell carcinoma. Investigation is being undertaken to estimate the nitrate content of vegetables in the South. Preliminary results show a hight nitrate content about 4 times that of lettuce from California. A report will be published later (FONG, 1981, personal communication).

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